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Jannetta Pearls!

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Introduction

We here describe ideal anesthetic goals for a patient presenting for microvascular decompression of trigeminal nerve (Jannetta procedure) with brainstem auditory evoked potential (BAEP) monitoring.

Case Description

A 62-year-old, 70 kg female on pharmacotherapy for intractable trigeminal neuralgia presented for posterior fossa craniotomy for Jannetta procedure with BAEP monitoring. Anesthetic challenges included positioning of the patient in a lateral position on Mayfield pins, management of trigeminal-cardiac reflex (TCR), retromastoid surgical exposure closer to sigmoid and transverse sinus, adequate brain relaxation, and maintenance of mean arterial pressure (MAP) > 70 mmHg (the lower limit of dynamic cerebral autoregulation). We used Intravenous anesthesia technique with continuous infusion of propofol, dexmedetomidine and remifentanil with ≤ 0.5 minimum alveolar concentration (MAC) of sevoflurane. Perioperative course was uneventful.

Jannetta Pearls

1. Position the patient in lateral position on Mayfield pins
2. Avoid hypertensive responses during intubation, insertion of Mayfield pins and emergence management of hemodynamic changes during trigeminal nerve manipulation
3. Prepare for bleeding risk during exposure closer to dural sinuses
4. Adequate brain relaxation
5. Maintain MAP above the lower limit of dynamic cerebral autoregulation
6. BAEP monitoring

Technique of brain relaxation during Jannetta:

1. Avoid hypertensive responses during critical periods
2. Maintain normocarbia ($PaCO_2$ of 35-40 mm Hg)
3. Mannitol ≥ 15 minutes
4. TIVA
5. Limit volatile anesthetic agent to ≤ 0.5 MAC

Our Anesthesia Technique

- Wide bore peripheral IV access
- *Monitor arterial blood pressure (ABP)*
- Adequate muscle relaxation
- *Avoid hypotension at induction*
- Avoid hypertensive responses during intubation, insertion of Mayfield pins and emergence
- *Administer remifentanil bolus during intubation and insertion of Mayfield pins*
- Maintain normal $PaCO_2$ (30-35 mmHg)
- Total intravenous anesthesia (TIVA) with propofol / remifentanil / dexmedetomidine
- Limit sevoflurane to ≤0.5 MAC

Intravenous or volatile anesthesia for Jannetta?[1]

Per current concepts, volatile anesthetic should be avoided in patients with persistently- or acutely-elevated intracranial pressure (ICP) until the dura is opened.[2] However, patients presenting for Jannetta usually do not have elevated ICP. Either TIVA or volatile anesthesia-based technique is acceptable, but volatile anesthetic agent concentration should be limited to 1.0 MAC. Another alternative would be propofol-based intravenous anesthetic technique with ≤0.5 MAC of volatile anesthetic agent.

Hemodynamic Changes during Jannetta

The manipulation of the trigeminal nerve can result in:

1. Hypertension and reflex bradycardia
2. Trigeminal-cardiac reflex resulting in bradycardia and hypotension[3]

Evoked Potential Monitoring during Jannetta

- ✓ BAEP Monitoring
- ✓ BAEP are resistant volatile anesthetic agents
- ✓ Either TIVA or volatile anesthetic is acceptable for BAEP

CONCLUSION

We achieved optimum brain relaxation by maintaining normocarbia and using TIVA as our primary anesthetic technique. We limited sevoflurane concentration to ≤0.5 MAC per current, evidence-based neuroanesthesia practice.[1,2] We limited hemodynamic changes by using remifentanil bolus for intubation and during insertion of Mayfield pins, and used remifentanil infusion to limit hemodynamic perturbations. We closely monitored hemodynamic changes with ABP monitoring and encountered no TCR.

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